



MUSHROOMS & FUNGI



1. What is a mushroom? _____

DATE COMPLETED: _____ **PASSED BY:** _____

2. What are the two major ways that mushrooms and fungi differ from plants?

- _____

- _____

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3. List and describe the two main functional parts of a mushroom or fungi.

- _____

- _____

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4. Mushrooms and fungi have can be grouped into four different types based on appearance. List and describe these types.

	Type	Description
a.	_____	_____
b.	_____	_____
c.	_____	_____
d.	_____	_____

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5. What are morels and truffles?

Morels _____

Truffles _____

DATE COMPLETED: _____ **PASSED BY:** _____

6. How can you tell which mushrooms are safe to eat?

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7. What steps should be taken if somebody eats an unknown (or a known to be poisonous) mushroom?

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8. List three problems or dangers (besides poisons/toxins from ingesting) that fungi pose to humans.
- _____
 - _____
 - _____

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1. Create a poster or display that includes:
- a. a diagram of a mushroom labeling at least six parts
 - b. pictures and information about five strange or unusual mushrooms and fungi.

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2. Do one of the following:
- a. Grow some edible mushrooms (this can be done from a kit). Keep a log with the details as shown below until there is no longer any significant changes. Show your mushrooms to your cadre.

Culture added to medium	Date	Time
Mushrooms first became visible	Date	Time
Growth — maximum size	Height	Diameter

- b. Take a field trip or hike. Make a scrapbook of at least six different mushroom specimens that you can find. Take a detailed photo (as close as your camera allows) or make a sketch of each one and document the following:
 - Appearance type (question #4 in learning)
 - Size
 - Color
 - Is it smooth or textured on the surface
 - Does it have gills or pores
 - Location (e.g. ground, stump, fallen tree, live tree)

PROJECT LOG		
Project	Date	Passed by
_____	_____	_____

DATE COMPLETED: _____ **PASSED BY:** _____

BADGE APPROVED BY: _____

BADGE COMPLETED ON: _____

Mushrooms & Fungi



PURPOSE

By studying some of the special characteristics of fungi, and certain very special types, we can gain an even greater appreciation for just how wonderfully our God watches over and controls His creation. Although mushrooms are not mentioned in the Bible, the steps to deal with mold and mildew are listed in the laws that God gave the Israelites.

LEARNING

1. Mushrooms are a fungal growth that typically takes the form of a domed cap on a stalk, often with gills on the underside of the cap. All mushrooms are fungi, but not all fungi are mushrooms.
2. Growth and Reproduction
 - a. The way they grow — mushrooms have no chlorophyll and do not make their own food. They extract nutrients from the soil or other medium that contains the correct balance of moisture and nutrient. Some live symbiotically (both benefit) or parasitically (only one benefits) on other plants.
 - b. The way they reproduce — fungi reproduce via spores and not seeds. Spores are produced by bacteria. They never have an embryo stage.
3. The umbrella-shaped body of a mushroom that we can see is called the fruit or sporophore. It only lives for a few days. The fruit starts out as a small button which grows into a stalk and a cap. The stalk or stem grows quickly because it can absorb a lot of water. As the cap becomes larger it unfolds like an umbrella. Soon small plates, called gills, appear under the mushroom's cap. They have small spores on them. When these spores fall off the mushroom, the wind blows them away. If they fall on a warm wet area, a new mycelium develops.

The underground part of the mushroom is the growing fungus. This is made up of many small, hair-like fibers that collectively are called the mycelium. These small fibers are individually called the hyphae. It gets food for the mushroom. Sometimes it dies quickly, but if it gets enough food it may live for hundreds of years.

4. Types of a Mushroom
 - a. Cap and stem
 - An obvious stem or stalk that supports the cap.
 - Commonly grows on or from the ground, although they can be found on tree trunks or stumps.

- b. Bracket or shelf type
 - The stem or stalk is usually non-existent or very small.
 - Commonly grows on some type of structure (rotting tree trunks or stumps).
- c. Branched or coral shaped
 - Stems or stalks branch out from a main bud or base area.
 - Commonly grows on the ground.
- d. Molds and fungus, crust-like or smooth
 - Structure is usually only visible under magnification.
 - Can consist of a cluster of cells that form spheres or globules.

5. Morels are a type of edible mushroom. They appear honeycomb-like with their cap made of a network of ridges and pits. They often grow in areas that have been recently burned by a forest fire. They are very difficult to grow on purpose so are not farmed. They must be cooked before eating as they often contain toxins. There are variations of false morels that are frequently poisonous so care must be taken if planning on eating them.

Truffles are underground versions of mushrooms, commonly found among the roots of trees. They do not have stems and the cap portion is fully enclosed so they look more like a small potato (marble to golf ball sized). They are spread when animals eat them and then excrete their waste elsewhere. Certain pigs and dogs are able to smell the truffles underground and are used by truffle seekers to find them. Dogs are preferred as the pigs damage the mycelia with their digging and tend to eat the truffles when they find them.

6. It can be very difficult to differentiate between types of mushrooms. Some need to be identified by microscopic or chemical analysis. Many types of mushrooms change shape and/or color as they mature, making it difficult to determine the specific type. There are books as well as guides on the Internet, that use color, size, texture, and physical features to help identify individual mushroom types.

The rule should be: Only consume mushrooms that an experienced adult has identified. Unless you are 100% sure of the species and type of mushroom you are about to eat DO NOT ATTEMPT TO EAT IT.

7. The effects of eating poisonous mushrooms do not always appear quickly. Depending on the type of mushroom the person who ate them may not feel anything for days but the toxins could be damaging the kidneys or liver to the point of no return before external symptoms are displayed. Children and the elderly are the most susceptible to effects of mushroom poisoning.

Any time someone has eaten mushrooms of an unknown variety you must assume the worst and get medical attention. Bring the Cadet (or counselor) to the hospital immediately. Calling ahead with a description of any symptoms and of the mushrooms will allow them to start investigating.

Keeping a sample of the mushrooms is helpful for medical staff to determine exactly which toxins they may be dealing with. Storing any uneaten mushrooms in paper is preferred, although a plastic bag is better than nothing.

Document as many details as possible: when they were eaten, when the symptoms started, the type of mushroom eaten, the quantity consumed, the location that the mushrooms were picked, what other foods or drinks were consumed (alcohol has a drastic effect on some mushroom toxins even if consumed within 24 hours of each other). With digital cameras it is often easy to take some pictures of the mushrooms and where they were growing. Pictures of other mushrooms nearby may help as some mushrooms will appear different as they age and mature.

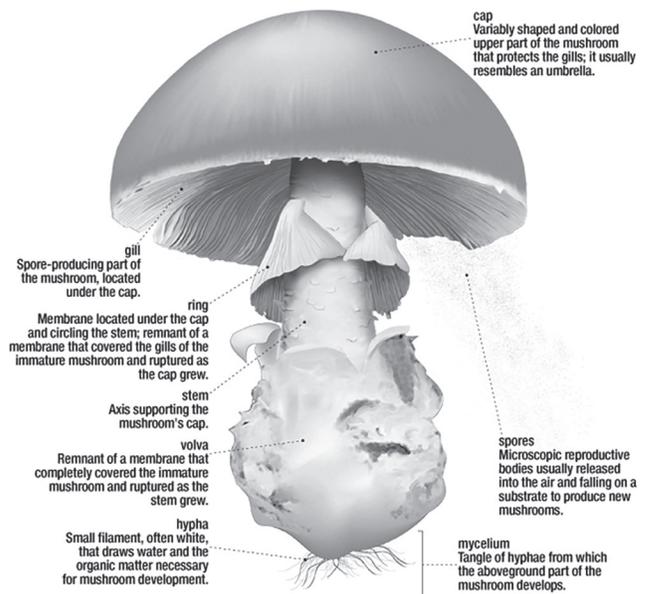
If the person throws up, keeping the stomach contents in a bag may be useful for the medical staff to identify the mushroom if you do not have other samples.

If medical attention is not nearby or readily available, induce vomiting to get rid of any toxins still in the stomach. The administration of activated charcoal may help limit the absorption of the toxins into the body, but this should not be given unless as a last resort or directed by medical professionals.

8. This question is open to the boys finding all sorts of issues that can be caused by fungi. Some possible issues include:
 - a. Mold spores — are a common component of household dust. When they are present in abnormally high quantities, they can present hazardous health risks to humans including allergic reactions, poisoning or fungal infections.
 - b. Mold in food products — are found on meat, poultry and grain crops. Losses occur both in the field and in storage for grain crops. Food can be rendered unfit for consumption. The mold can produce mycotoxins which, when ingested, inhaled or absorbed through the skin can have effects such as reduced appetite, general malaise to acute illness or even death.
 - c. Damage to building materials — a wood-decay fungus digests moist wood, causing it to rot. Some fungi will attack dead wood, others will attack living trees.
 - d. Fungal infections in your body — athlete's foot, jock itch, ringworm, and yeast infections on the skin. Fungal meningitis and blood infections are less common than skin or lung infections, but can be deadly.

DOING

1. See illustration.



2. Self-explanatory.
3. Self-explanatory.